

## Mayfly (Ephemeroptera) Fauna of North Korea (2)

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**Abstract** Mayfly fauna was investigated from four major localities (Pyongyang, Haeju, Myohyangsan, and Paektusan) in North Korea based on materials by a Hungarian collecting expedition to the country in 1988. Forty-six species (including 10 undetermined) of Ephemeroptera in 12 families were recognized and listed with their sampling sites.

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**Key words** Mayflies, Ephemeroptera, systematics, fauna, North Korea

### INTRODUCTION

Since early this century, mayflies of Northeast Asia have been variously studied from Japan, Far East Russia, and Korea (see Bae, 1997 for historical review). Ephemeroptera of Northeast Asia is now on a general revision by the senior author (Bae *et al.*, 1994; Bae, 1997; Bae *et al.*, 1997).

Although Imanishi (1940) reported 38 species of mayflies from North Korea, there have been no comprehensive systematic studies of mayflies from the country. In 1986, as a part of Czech collecting expedition to North Korea, Soldán collected mayflies from five major localities in the country. Part of the work, e.g., heptageniid fauna, was published previously (Braasch and Soldán, 1988), but majority of the work has been submitted for publication simultaneously with this study (see Bae and Soldán, 1997).

In a Hungarian collecting expedition to North Korea in 1988, the junior author of this paper had an opportunity to collect mayfly materials from four major localities in North Korea (see below). We herein present all those species (refer to Bae *et al.*, 1994, 1997, etc. for monenclatural changes in some species) and locality records although part of the species left undetermined for further studies. All materials are deposited at Seoul Women's University in Seoul and in Andrikovics' personal collection in Hungary.

#### Localities and Collecting Sites

##### I. Pyongyang

I-a: Taedong river, Pyongyang: Collecting dates July 4-5, 1988.

Adults were collected at the center of Pyongyang city near Taedong river on the 4th and 5th of July by light trap. Larvae were collected from the Taedong river on the 5th of July by hand net.

**II-b:** Taedong river, Pyongyang: Collecting date July 16, 1988.

Adults were collected by light trap.

**II-c:** Hajang creek at Taesongsan (Mt.) near Pyongyang: Collecting date July 6, 1988.

Larvae were collected from the small stream by hand net.

**II-d:** Tongchon lake at Taesongsan (Mt.) near Pyongyang: Collecting date July 6, 1988.

Larvae were collected from the small pond by hand net.

## **II. Haeju**

**III-a:** Haesu creek at Suyangpokpo on the way to Haeju: Collecting date July 16, 1988.

Larvae were collected by hand net.

**III-b:** Yangyang creek near Haeju city: Collecting date July 17, 1988.

Larvae were collected by hand net.

**III-c:** Simgwang creek near Haeju city: Collecting date July 17, 1988.

Larvae were collected by hand net.

**III-d:** Pyoksong creek near Haeju city: Collecting date July 17, 1988.

Larvae were collected by hand net.

## **III. Myohyangsan**

**IIII-a:** Chongchon river near Hyangsan: Collecting date July 7, 1988.

Larvae were collected by hand net.

**IIII-b:** Hyangsan, Pyonganbuk-do: Collecting date July 7, 1988.

Adults were collected by light trap.

**IIII-c:** Hyangsan creek at 1 km from Sangwonam waterfall: Collecting date July 7, 1988.

Larvae were collected by hand net.

**IIII-d:** Hyangsan creek at 2 km from Sangwonam waterfall: Collecting date July 7, 1988.

Larvae were collected by hand net.

**IIII-e:** Hyangsan creek at 2.1 km from Sangwonam waterfall: Collecting date July 7, 1988.

Larvae were collected by hand net.

**IIII-f:** Hyangsan creek at 2.5 km from Sangwonam waterfall: Collecting date July 7, 1988.

Larvae were collected by hand net.

**IIII-g:** Hyangsan city at Hyangsan hotel: Collecting dates July 7-8, 1988.

Adults were collected by light trap (160W Mg bulb) or at windows.

**IIII-h:** Tributary stream of Chongchon river near Hyangsan: Collecting date July 8, 1988.

Larvae were collected by hand net.

**IIII-i:** Hyangsan creek at Habiroam: Collecting dates July 9, 1988.

Larvae were collected by hand net.

#### IV. Paektusan

IV-a: Pochon city at Paektu hotel: Collecting date July 12, 1988.

Adults were collected by light trap in front of the hotel at the bank of the river.

IV-b: Samjiyon near Samjiyon hotel: Collecting date July 12, 1988.

Larvae were collected from a creek in the bog beside the road.

IV-c: Karim creek: Collecting date July 12-13, 1988.

Larvae were collected from the stream, inflow of the Amnok river.

IV-d: Pochon town: Collecting date July 13-14, 1988.

Adults were collected by light trap.

### LIST OF SPECIES

#### Family Ameletidae

1. *Ameletus montanus* Imanishi

Materials examined: III-i: 2L.

2. *Ameletus* sp. 1

Materials examined: III-i: 1L (L parts on slide); IV-b: 1L; IV-c: 1L (mouthparts on slide).

#### Family Baetidae

3. *Baetiella tuberculata* (Kazlauskas)

Materials examined: II-a: 1L (L parts on slide).

4. *Baetis fuscatus* (Linnaeus)

Materials examined: II-b: 2L; III-c: 2L; III-i: 7L.

5. *Baetis* sp. 1

Materials examined: III-i: 1L (L parts on slide).

6. *Baetis* sp. 2

Materials examined: III-i: 2L; IV-c: 10L (L parts on slide).

7. *Cloeon dipterum* (Linnaeus)

Materials examined: I-d: 1L.

8. *Procloeon* sp. 1

Materials examined: III-i: 2L (L parts on slide).

## Family Caenidae

9. *Caenis* sp. 1

Materials examined: I-a: 1M.

10. *Caenis* sp. 2

Materials examined: IV-d: 2M.

## Family Ephemerellidae

11. *Ephemerella* (*Drunella*) *aculea* (Allen)

Materials examined: III-h: 1F; IV-a: 1M (genitalia on slide) & 1F; IV-d: 1F.

12. *Ephemerella* (*Drunella*) *criptomeria* (Imanishi)

Materials examined: III-a: 1L.

13. *Ephemerella* (*Drunella*) *lepnevae* (Tshernova)

Materials examined: IV-c: 284L (L parts on slide).

14. *Ephemerella* (*Drunella*) *triacantha* (Tshernova)

Materials examined: IV-c: 1L (L parts on slide).

15. *Ephemerella* (*Ephemerella*) *aurivillii* (Bengtsson)

Materials examined: IV-c: 1L.

16. *Ephemerella* (*Ephemerella*) *dentata* Bajkova

Materials examined: II-b: 3L; III-g: 1M, 7F & 1Ms; III-h: 1M & 7F; IV-d: 11F.

17. *Ephemerella* (*Ephemerella*) *kozhoi* Bajkova

Materials examined: III-i: 4L.

18. *Ephemerella* (*Ephemerella*) sp. 1

Materials examined: I-c: 3L; IV-b: 3L.

19. *Ephemerella* (*Serratella*) *ignita* (Poda)

Materials examined: II-b: 1L; III-h: 1M (genitalia on slide); III-i: 9L.

20. *Ephemerella* (*Serratella*) *setigera* (Bajkova)

Materials examined: IV-c: 3L.

21. *Ephemerella (Serratella) zapetkinae* (Bajkova)

Materials examined: III-i: 7L.

22. *Ephemerella (Uracanthella) rufa* (Imanishi)

Materials examined: II-b: 8L; II-c: 2L.

## Family Ephemeridae

23. *Ephemera orientalis* McLachlan

Materials examined: I-a: 1M, 104Ms &amp; 102Fs; I-b: 1Ms &amp; 2Fs.

24. *Ephemera sahalinensis* Matsumura

Materials examined: III-g: 1F.

## Family Heptageniidae

25. *Cinygmula* sp. 1

Materials examined: IV-c: 10L.

26. *Cinygmula* sp. 2

Materials examined: IV-c: 1L.

27. *Ecdyonurus abracadabrus* Kluge

Materials examined: III-g: 1M &amp; 1F; III-i: 32L.

28. *Ecdyonurus bajkova* Kluge

Materials examined: III-g: 5M &amp; 13F; III-h: 4M &amp; 9F.

29. *Ecdyonurus kibunensis* Imanishi

Materials examined: III-d: 5L; III-f: 3L; III-g: 1Ms; III-h: 3M, 1F, 2Ms &amp; 2Fs; III-i: 16L.

30. *Ecdyonurus levis* (Navás)

Materials examined: II-d: 6L; III-e: 5L; III-i: 125L; IV-b: 2L.

31. *Ecdyonurus scalaris* Kluge

Materials examined: II-c: 13L; III-a: 1L; III-c: 2L; III-g: 2M; III-h: 2M.

32. *Epeorus curvatulus* Matsumura

Materials examined: II-a: 6L; III-i: 10L.

33. *Epeorus pellucidus* (Brodsky)

Materials examined: II-c: 15L; II-d: 27L; III-d: 1L; III-g: 1F; III-h: 1M & 1 F; III-i: 19L; IV-a: 1M; IV-c: 1L.

34. *Iron aesculus* (Imanishi)

Materials examined: IV-c: 15L.

35. *Rhithrogena lepnevae* Brodsky

Materials examined: III-g: 1M (genitalia on slide); III-h: 1M (genitalia on slide); IV-a: 5M (genitalia on slide); IV-d: 8M & 2F.

## Family Isonychiidae

36. *Isonychia japonica* (Ulmer)

Materials examined: III-g: 2M (genitalia on slide) & 3F; III-h: 1M & 1F; III-i: 1L (mouthparts on slide).

## Family Leptophlebiidae

37. *Choroterpes (Euthraulius) altiocus* Kluge

Materials examined: II-a: 2L; II-c: 4L; II-d: 2L; III-a: 5L; III-d: 1L; III-g: 1M & 7F; III-h: 19F, 1Ms & 2Fs.

38. *Paraleptophlebia chocolata* Imanishi

Materials examined: II-d: 1L (mouthparts on slide); III-a: 1L; III-d: 1L; III-e: 1L; III-f: 1L; III-i: 2L.

39. *Paraleptophlebia* sp. 1

Materials examined: IV-b: 9L.

## Family Metretopodidae

40. *Metretopus borealis* Eaton

Materials examined: IV-b: 5L.

## Family Polymitarcyidae

41. *Ephoron shigae* (Takahashi)

Materials examined: I-c: 1L.

## Family Potamanthidae

42. *Potamanthus luteus oriens* Bae and McCafferty

Materials examined: I-a: 3Ms & 2Fs.

43. *Potamanthus yooni* Bae & McCafferty

Materials examined: III-b: 1F.

44. *Rhoenanthus coreanus* Yoon & Bae

Materials examined: I-a: 1M, 1F, 4Ms & 2Fs.

Family Siphonuridae

45. *Siphonurus chankae* Tshernova

Materials examined: IV-b: 3L.

46. *Siphonurus palaearticus* Tshernova

Materials examined: III-h: 1F.

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## 북한의 하루살이목 분포상 (2)

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1988년 북한의 4개 주요 지역(평양, 해주, 묘향산, 백두산)에서 헝가리 학술조사단에 의하여 채집된 표본을 이용하여 하루살이목의 분포상이 조사되었다. 조사의 결과 하루살이목의 12개 과에서 46종(미동정종 10종 포함)이 밝혀졌고, 그 채집지와 함께 목록을 작성하였다.

검색어 : 하루살이목, 분류, 분포상, 북한

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